

Lesson Summary

Two equations define the same line if the graphs of those two equations are the same given line. Two equations that define the same line are the same equation, just in different forms. The equations may look different (different constants, different coefficients, or different forms).

When two equations are written in standard form, $ax + by = c$ and $a'x + b'y = c'$, they define the same line when $\frac{a'}{a} = \frac{b'}{b} = \frac{c'}{c}$ is true.

Problem Set

1. Do the equations $x + y = -2$ and $3x + 3y = -6$ define the same line? Explain.
2. Do the equations $y = -\frac{5}{4}x + 2$ and $10x + 8y = 16$ define the same line? Explain.
3. Write an equation that would define the same line as $7x - 2y = 5$.
4. Challenge: Show that if the two lines given by $ax + by = c$ and $a'x + b'y = c'$ are the same when $b = 0$ (vertical lines), then there exists a nonzero number s so that $a' = sa$, $b' = sb$, and $c' = sc$.
5. Challenge: Show that if the two lines given by $ax + by = c$ and $a'x + b'y = c'$ are the same when $a = 0$ (horizontal lines), then there exists a nonzero number s so that $a' = sa$, $b' = sb$, and $c' = sc$.